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An IOT Based Wearable Device Made With The Objective To Take A More Combative Approach Towards Women, Teenagers And Minors Safety And Wellbeing.

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Abstract: Women's safety is becoming increasingly important in many parts of the world. women's crimes are increasing at an alarming rate. Women safety has always been an issue in India and there are lot of improvements that should be made and steps that should be taken for these concerns to get minimal and to start cleaning the issue the women safety band has been designed and kept in mind. To address this issue, a technology-driven solution with the it is possible to develop with the help ofthe most recent technological advancements. The product ensures the safety of women. It helps toidentify and call on resources to help users out of dangerous situations which reduce risk and bringassistance when we in danger the help us to send the location to the contacts.

Not only does it do the above, but it also gives women confidence to step out, especially in localities where crimes against women are common Knowledge of our product will make criminals more aware and think twice before doing something.In exchange, our product will empower women and spread fear in the hearts of such criminals. It was found that the frequency of female and children leaving house for any purpose has been noted as 24.5% on

regular/ everyday basis, 26.5% never goes out, 18.7 which goes once in a weekand 30.3% for 2-3 times a week, while The frequency of females and children leaving house for any purpose has been noted as 24.5% on a regular/ everyday basis, while 26.5% never go out, 18.7 take an outing once a weekand 30.3% enjoy the outdoors, 2-3 times a week.

Key words:- Women safety, Wearable IOT based wellness, Wearable IOT based protection, technology, empower, wearable band for protection of women, taking a stand for women's safety, women

1. Introduction :-

Our IoT based wristband is a wearable device that is equipped with sensors, communication technologies, and processing capabilities to collect and transmit data over the internet. It can be worn like a watch or a bracelet and can be used for a variety of applications. Some of the common features of the IoT based wristband, The band includes:

Sensors: The wristband may have sensors to monitor various parameters like heart rate, temperature, blood oxygen level, and activity level.

Communication technologies: The wristband may use Bluetooth, Wi-Fi, or other wirelesstechnologies to communicate with other devices or the internet.

Processing capabilities: The wristband may have a microcontroller or a microprocessor to process thedata collected by the sensors and to execute other functions.

Battery: The wristband may have a rechargeable battery to power the device.

Display: Some wristbands may have a display to show the data collected by the sensors or to provideother information.

Some of the applications of the IoT based wristband are:

Health and fitness tracking: The wristband can be used to monitor vital signs and activity levels tohelp people maintain a healthy lifestyle.

Safety and security: The wristband can be used as a panic button to call for help in case ofanemergency.

Smart home control: The wristband can be used to control various devices in a smart home likelights, locks, and thermostats.

Payment and access control: The wristband can be used as a payment device or to grant accesstorestricted areas.

Overall, an IoT based wristband can be a versatile device that can be used for a variety of applications depending on the features and functionalities it offers.

Advantages of IoT based wristband:

Health monitoring: An IoT based wristband can be used to monitor various health parameters likeheart rate, blood pressure, and sleep patterns, which can help individuals to manage theirhealth better.

Fitness tracking: With the help of sensors in the wristband, people can track their daily activity levels,calories burned, and distance traveled, which can help them to achieve their fitness goals.

Safety and security: An IoT based wristband can be used as a panic button to call for help in caseofan emergency.

Convenience: An IoT based wristband can be a convenient device to control various devices in asmart home or make payments without carrying cash or credit cards.

Customization: Wristbands can be customized to suit the needs of the user, with various sensors and features added to monitor specific health parameters or perform specific functions.

2. Profile of Sample unit: -

Center for management studies, an essential part of Jain (Deemed to be University), it is the ultimate destination for students where they are equipped with the necessary tools to fulfill their academic goals and transform themselves into extraordinary personalities. It is one of the top management centers with the best facilities in Bengaluru. Students are prepared for successful careers in management, finance and communication and can pursue extracurricular activities simultaneously. CMS, provides students with essential facilities to fulfil their academic goals and transform them into extraordinary personalities. The college is a proud member of United Nations Academic Impact. It is ranked 12th among the Best Colleges in India and ranked 5th for Academic Excellence by India Today. It is also 13RC SurveyRated 'A' at the State level & 'A' atNational Level by CRISIL for 2019.

3. Review of Literature: -

Ms. Aditi Chowdhuri:- A similar device proposed has an ARM controller and an android application. The functionality it provides is sending an SOS message with latitudes and longitudes to a pre-set of contacts, and record the entire incident to be used as evidence.

D.G Monisha:- Women empowerment technology will provide dedtailed information on domestic violence, prevention of crimes and health tips for women and the other vulnerablesections of society, such as teenagers, etc.

Muhammad Usman Bajwa:-

Women develop cities, they are required to visit workplaces, and experience public spaces which can often cause discomfort, hence using technology to overcome it is essential.

4. Statement of the problem:-

There are many factors that contribute to women's safety being compromised. One of the primary reasons is the prevalence of gender-based violence, including sexual assault, domestic violence, and harassment. These forms of violence are often rooted in patriarchal attitudes and beliefs that perpetuateharmful gender stereotypes and contribute to a culture of toxic masculinity. Additionally, women are often at greater risk of violence and exploitation due to their marginalized status in society, including their lower social, economic, and political power. Women also face significant barriers to accessing justice and support when they experienceviolence or abuse, such as fear of retaliation, social stigma, and discrimination. Other factors that contribute to women's insecurity and vulnerability include poverty, lack ofeducation, limited access to healthcare, and weak legal protections. Overall, the issue of women's safety is complex and multifaceted, and addressing it willrequire a concerted effort from individuals, communities, and governments alike.

5. Objectives of The study:-

The purpose of this study is to delve deeper into how our product can help revolutionize women's safety and wellbeing, not just for women but also for teenagers who are equally vulnerable to the risks and challenges of modern society. We recognize that women often face a multitude of obstacles and threats in their daily lives,from sexual harassment to physical violence, and we believe our product can be a valuable tool to address these issues. Our aim is to enhance our value-added services and concentrate on product development toensure we can provide the most effective and efficient solutions possible. In order to achievethis, it's crucial that we conduct a thorough study of the needs and requirements of our target audience, as well as identify the problems and challenges that women and teenagers are facing in today's society. By gaining a better understanding of these issues, we can tailor our product to meet the specific needs of our customers and provide the best possible service to enhance women'ssafety and well-being.

6. Scope of study :-

The purpose of an IoT-based women protection wristband is to enhance the safety and security of women in various settings, especially in situations where they may face threats or risks of violence, harassment, or other forms of harm. The wristband typically integratesvarious sensors, communication modules, and alert mechanisms to detect and respond toemergency situations quickly and effectively. Some potential purposes of the IoT-based women protection wristband could include:

1. Emergency Alerts: The wristband could trigger an alert to a pre-defined list of emergency contacts or service providers, such as police, ambulance, or rescueteams, when the wearer faces a dangerous situation, such as physical assault,kidnapping, ormedical emergency.
2. Location Tracking: The wristband could use GPS or other location-based technologies to track the wearer's location and transmit it to the emergency responders or the wearer's trusted contacts. This could help locate the wearer quicklyand accurately, especially in remote or unfamiliar areas.
3. Self-Defense Mechanisms: The wristband could be equipped with self-defense mechanisms, such as pepper spray, sound alarms, or stun guns, to deter or incapacitate the attacker and give the wearer time to escape or seek help.
4. Health Monitoring: The wristband could monitor the wearer's health status, such asheart rate, blood pressure, or glucose level, and alert the emergency responders orthe wearer's healthcare provider in case of any abnormalities or emergencies.
5. Deterrence and Awareness: The wristband could serve as a visible deterrent to potential attackers or harassers, as well as raise awareness about the prevalence andseriousness of violence against women. It could also provide a sense of empowerment and confidence to the wearer, knowing that they have a reliable tool toprotect themselves.

Overall, the purpose of an IoT-based women protection wristband is to provide a proactive and preventive measure against violence and empower women to live and move freely andsafely in theircommunities.

7. Methodology :-

To study and to know about the usability of the band for the general public, an online questionnaire was developed in which all age group and genders were asked to submit their views and response. To ensure that each response is genuine the online link of the questionnaire was linked with the email of the person so that one person can not submit many responses. The online survey was conducted on 3rd march 2023 and total of 162 responses were taken. Following are the data collected from the survey.

8. Data analytics:-

Chart 1.

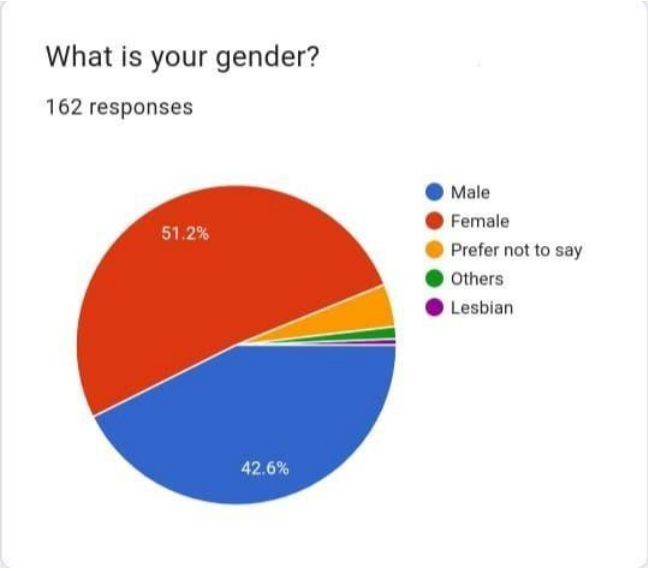


Chart 1. This pie chart represents the gender wise classification of the respondents selectedfor the study .

Table 1: -

Sl no.	Respondents gender	No. of respondents	percentage
1	Female	83	51.2%
2	Male	69	42.6%
3	Other	10	6.2%

(source: primary data)

Table 1 discloses the gender of the respondents. Of a total of 163 respondents, 51.2% were female, 42.6% were male and the remainder ofparticipants identified as a they/ them.

Chart 2.

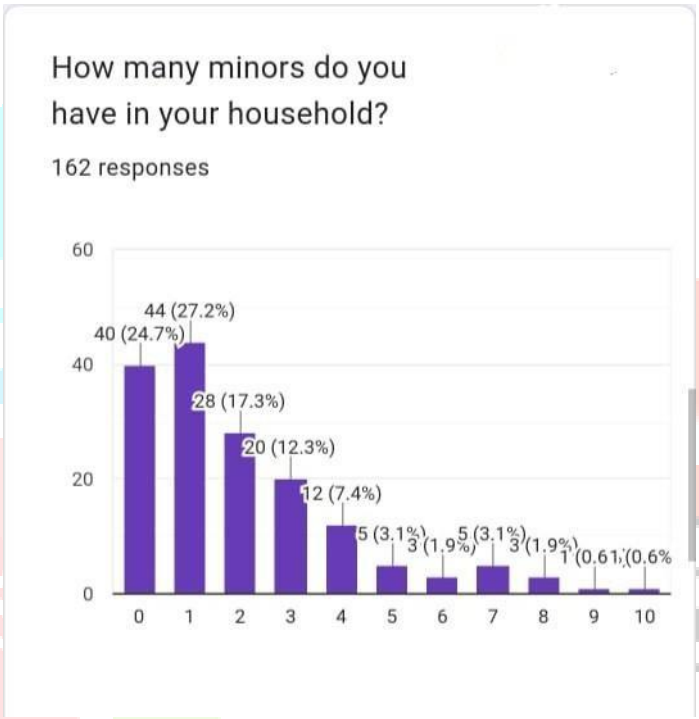


Chart 2. This bar graph reveals the number of minors in the respondants family.

Table 2: -

Sl no.	Females in	No. of	Percentage
1	1	30	20.3%
2	2	68	44.3%
3	3	40	23.4%
4	>3	20	12%

(source: primary data)

Table 2 reveals the number of female members in the families of the respondants. Of 158 people, 20 respondents had more than three females in the instant family. 40 respondents (23.4%) had three female members, 68 had 2 female members while 30 had only one female in the family.

Most of the respondents had only 2 female members in their instantfamily. (44.3%)

Chart 3.

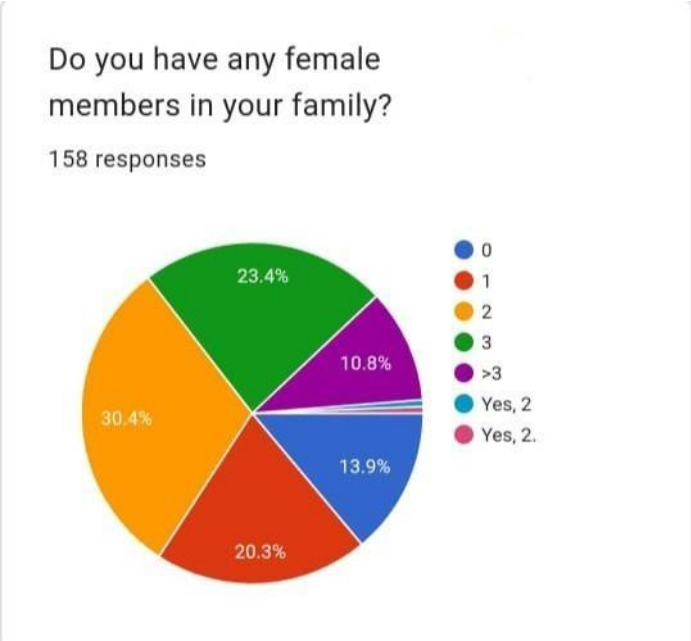


Chart 3. The following graph reveals the number of female members in the family.

Table 3: -

Sl no.	On being asked if respondents would want to receive anSOS signal	No. of respondents	percentage
1	Yes	104	68%
2	No	49	32%

(source: primary data)

On analysing table 3, it is evident that over 68% would like to have the optional feature enabled to receive a distress message or an SOS notification on their smart phone devices in the occasion that amember of their family equipped with the protection band has to press the buttonover an unfortunate incident.

Chart 4.

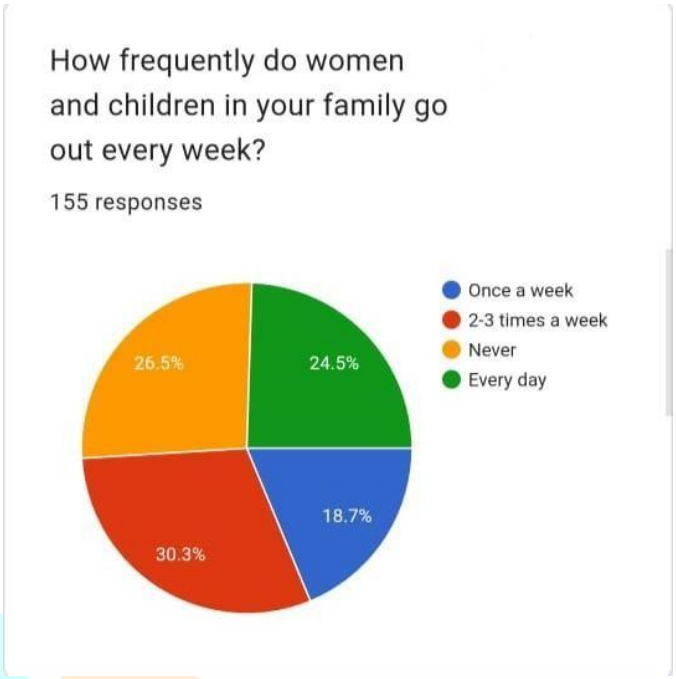


Chart 4. The following data in the survey tells us about the frequency of the women and children in the family that go out every week.

Table 4: -

Sl no.	Frequency of outings of women and	No. of respondents	percentage
1	Never	41	26.5%
2	Once a week	29	18.7%
3	2-3 times a	47	30.3%
4	Everyday	38	24.5%

(source: primary data)

24.5% of the respondent family's women and minors visited outside the household everyday of the week. This data reveals to us the growing importance of women and children safety in today's world. With around 55% of the women and children having outings at least 2-3 times a week, emphasis is placed on their safety at all times andour product would be equipped to making parents and adults at the household add an extra layer of security and supervision.

Chart 5.

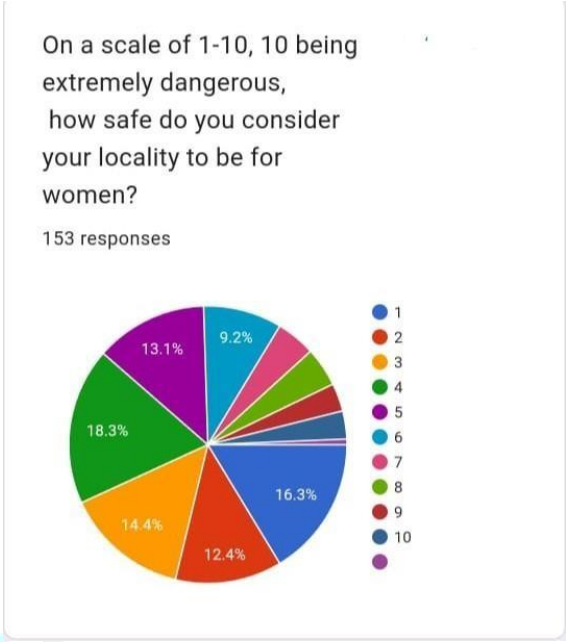


Chart 5. Shows us that on a scale of 1-10 how safe does the respondents feel about theirsociety for women.

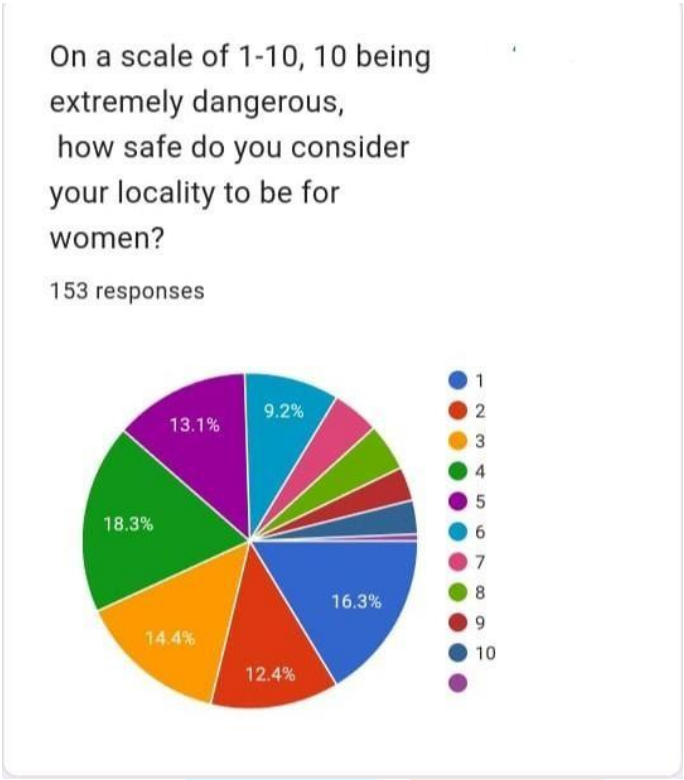
Table 5: -

Sl no.	No. of minorsin the	No. of respondents	percentage
0	0	40	24.7%
1	1	44	27.2%
2	2	28	17.3%
3	3	20	12.3%
4	4	12	7.4%
5	5	5	3.1%
6	6	3	1.9%
7	7	5	3.1%
8	8	3	1.9%
9	9	1	0.6%
10	10	1	0.5%

(source: primary data)

Of the 160+ respondents, a combined approximate of 52%, had between 0-1 minors in the family, while about 29.6% had between 2and 4 minors in the household. About 82% of the total respondents had from 0-4 minors, while the remaining 18% had from between 4 and 10 minors in their household.

Chart 6.



Scale of 1-10.	On a scale of 1-10 How safe doeswomen consider the society
1	16.3
2	12.4
3	14.4
4	18.3
5	13.1
6	9.2
7	5.3
8	5.1
9	2.7
10	3.3

Chart 6. The respondents were asked. If they would buy this product for themselves or theirfamily members.

Chart 7.

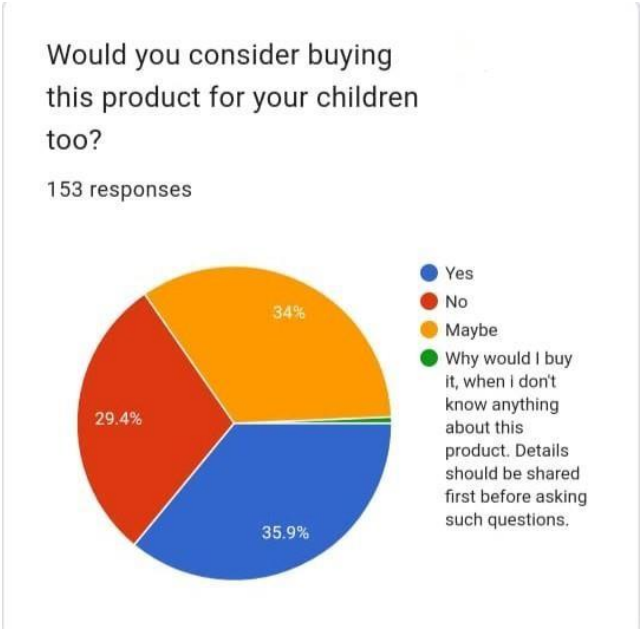


Chart 7. In the survey the respondents were asked if they would buy this product for theirchildren

Sl no.	If the public would consider buying the product for their children	Percentage of responds
1	Yes	35.9
2	No	29.4
3	Maybe	34

Chart 8.

Sl no.	Pricing	Percentage
1	500-1000	17.3
2	1000-2000	28.7
3	2000-3000	37.3
4	>3000	15.3

Chart 8. Pricing plays a very important role specially in a place like India so this graph is the representation of the responds which we received for the pricing of the wrist band.

Chart 9.

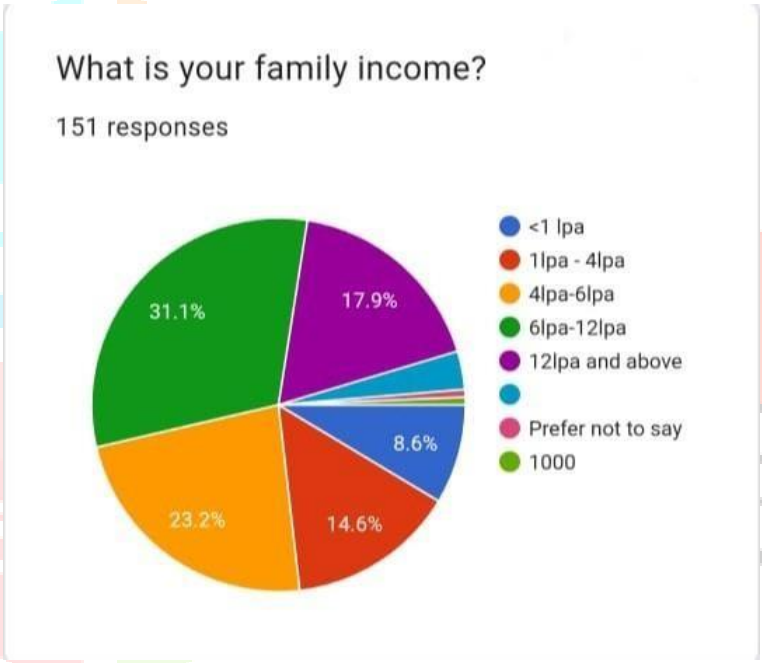


Chart 9. Family income of the respondents was collected to know if pricing was not the issue which would lead to not buy the band.

Sl no.	Family income of the respondents	Percentage
1	<1 LPA	8.6
2	1Lpa - 4Lpa	14.6
3	4Lpa-6Lpa	23.2
4	12Lpa and above	31.3
5	Prefer not to say	17.9

Chart 10.

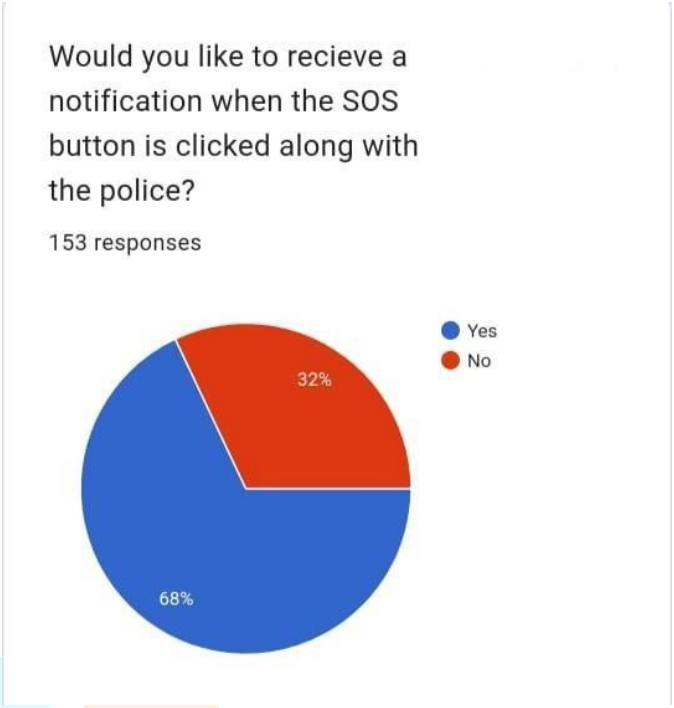


Chart 10. People were asked if they were comfortable with police getting involved bypressing the button.

Sl no	Police involvement is preferred or not	Percentage
1	Yes	68
2	No	32

9. Findings :-

A. In the survey it was found out that 51.2 % of the respondents were female, 42.6 % weremale and the rest were of other genders.

B. The researcher found out that 24.7 % people did not have minors in their house, 27.2 %have 1 minor, 17.3% have 2 minors and the rest have more than 3 minors in theirhouse.

C. It is found out that 13.9 % of the people does not have female in their house, 20.3% have1 female, 30.2% have 2 females in the house and rest have 3 or more than 3 females in their house.

D. The frequency of female and children leaving house for any purpose has been noted as 24.5% on regular/ everyday basis, 26.5% never goes out, 18.7 which goes once in aweekand 30.3% for 2-3 times a week.

E. It has been found that 35.6 % people will buy the product for their children, 29.4% people would not buy and 34 percent people still have doubts.

F. Family income of most of the people is 6 lakhs - 12 lakhs per year (31.1% people) 17.9% of people have more than 12 lakhs. 8.6% people have less than 1 lakh per annumand therest of them come under 1 lakh to 6 lakh.

G. It is found that 68% people want police to get involved along with themselves in the alerting procedure, where as 32% people only want the police getting involved.

10. Suggestions:-

1. User-Centered Design: The wristband should be designed with the user's needs and preferences in mind, considering factors such as comfort, ease of use, and aestheticappeal. The design should also be flexible and customizable to accommodate different cultural, social, and economic contexts.

2. Multi-Sensor Integration: The wristband should integrate multiple sensors, such as accelerometers, gyroscopes, GPS, and heart rate monitors, to provide a comprehensive and accurate detection of emergency situations. The sensors shouldbe calibrated and tested to ensure their reliability and privacy.

3. Reliable Communication: The wristband should use a reliable and secure communication protocol, such as Bluetooth Low Energy, Wi-Fi, or GSM, to transmit emergency alerts and location data to the relevant parties. The communication shouldbe encrypted and authenticated to prevent hacking or spoofing.

4. Context-Aware Responses: The wristband should provide context-aware responsesto different emergency situations, such as calling the police for physical assault, sending a distress message for harassment, or providing first aid instructions for medical emergencies. The responses should be timely, relevant, and easy to follow.

5. Community Engagement: The wristband should be integrated into a broader community- based approach to women's safety, involving stakeholders such as women's organizations, law enforcement agencies, healthcare providers, and tech companies. The community engagement should ensure that the wristband meets thediverse needs and expectations ofdifferent groups and fosters a sense of collective responsibility for women's safety.

6. Continuous Improvement: The wristband should be continuously tested, evaluated,and improved based on user feedback, technological advances, and emerging threats. The continuous improvement should ensure that the wristband remains relevant, effective, andsustainable over time.

11. Conclusion :-

Women safety has always been an issue in India and there are lot of improvements that should be made and steps that should be taken for these concerns to get minimal and to start cleaning the issue the women safety band has been designed and kept in mind. This will not only assure
women's safety but give every family members and themselves a hope that there is someone which has this responsibility and if needed it will provide the security.

In India there are thousand of cases related to women exploitation. Many women and minors go through difficulties that are unspeakable of. The **Fibros band** is a hope and protector towards all vulnerable members of society.
The product can be utilized by any members of society who feel their protection is of importance, however it is focused towards women and minors as we live in a society where they face many atrocities. Many women do not even work in some areas because they feel unsafe, and have to compromise with their work schedule, worst case scenario being having to quit working all together, but now with the helpand support of the band they can freely go and without fear work as per their schedule.

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